Monitoring Tools to Support Exposure Assessment at Various Geographic Scales

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Role of ambient monitoring in exposure assessment

- Characterize ambient concentrations and deposition in representative monitoring areas
  - Limitations of fixed station monitors
    - Do not directly estimate human inhalation exposure
    - Are appropriate for ecosystem exposure
    - Many stations may be needed to capture local structure
    - Not cost effective to have monitors everywhere
- Ambient monitors support exposure models
    - Can provide required outdoor concentrations
      - If there is adequate temporal and spatial coverage
    - Evaluate dispersion and deposition models
- Establish trends and evaluate the effectiveness of controls

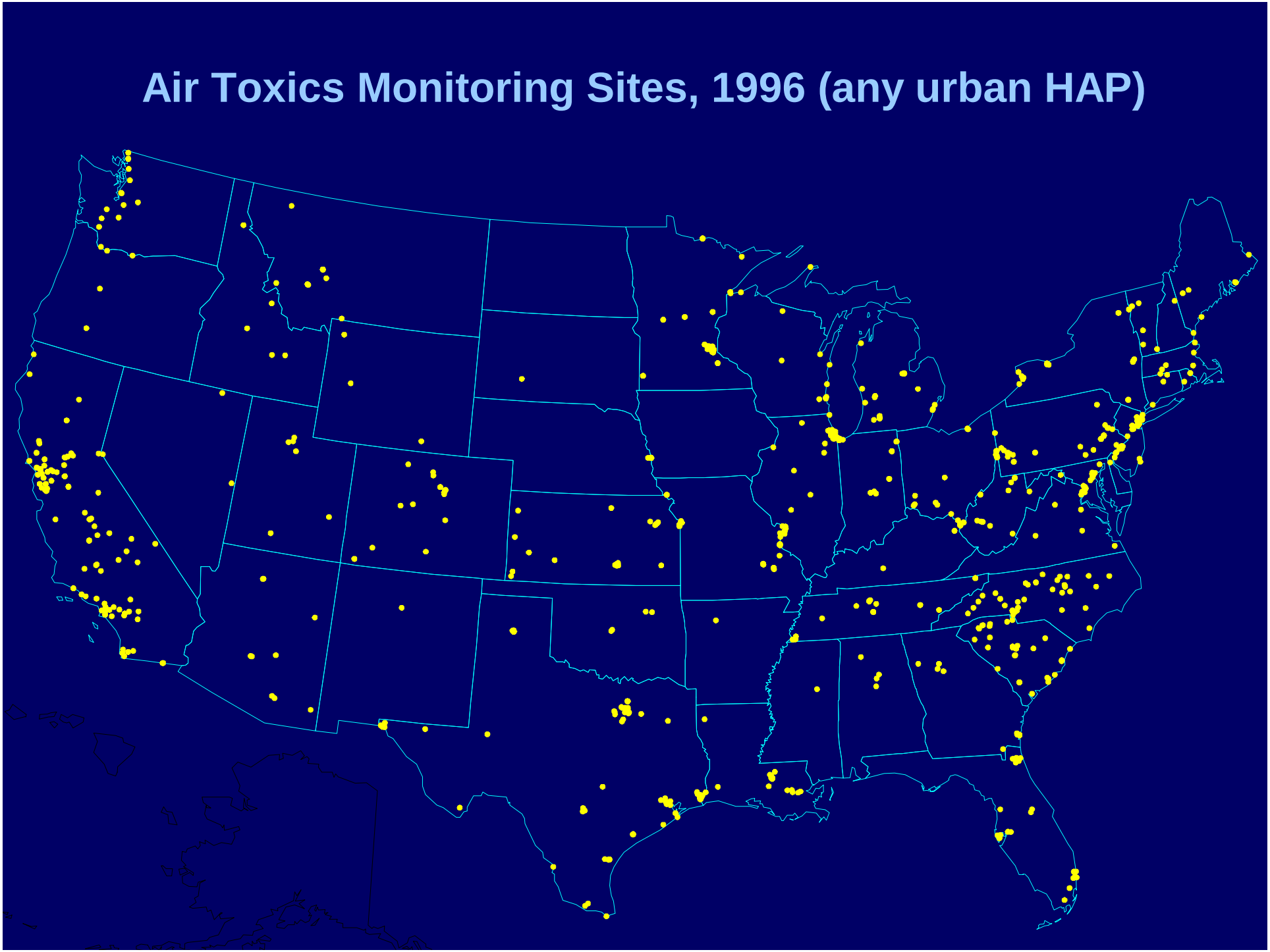
Network Design to Match Geographic Scale of Analysis and Intended Data Use

- Regional/national scale
  - Representative monitoring locations
    - Community-wide (neighborhood)
    - Typical source impacts
    - Different climatological/emission regimes
  - Duration
    - Year(s)
    - Year-round monitoring
  - Sampling interval & frequency
    - Intermittent, 24-hr

Network Design to Match Geographic Scale of Analysis (continued)

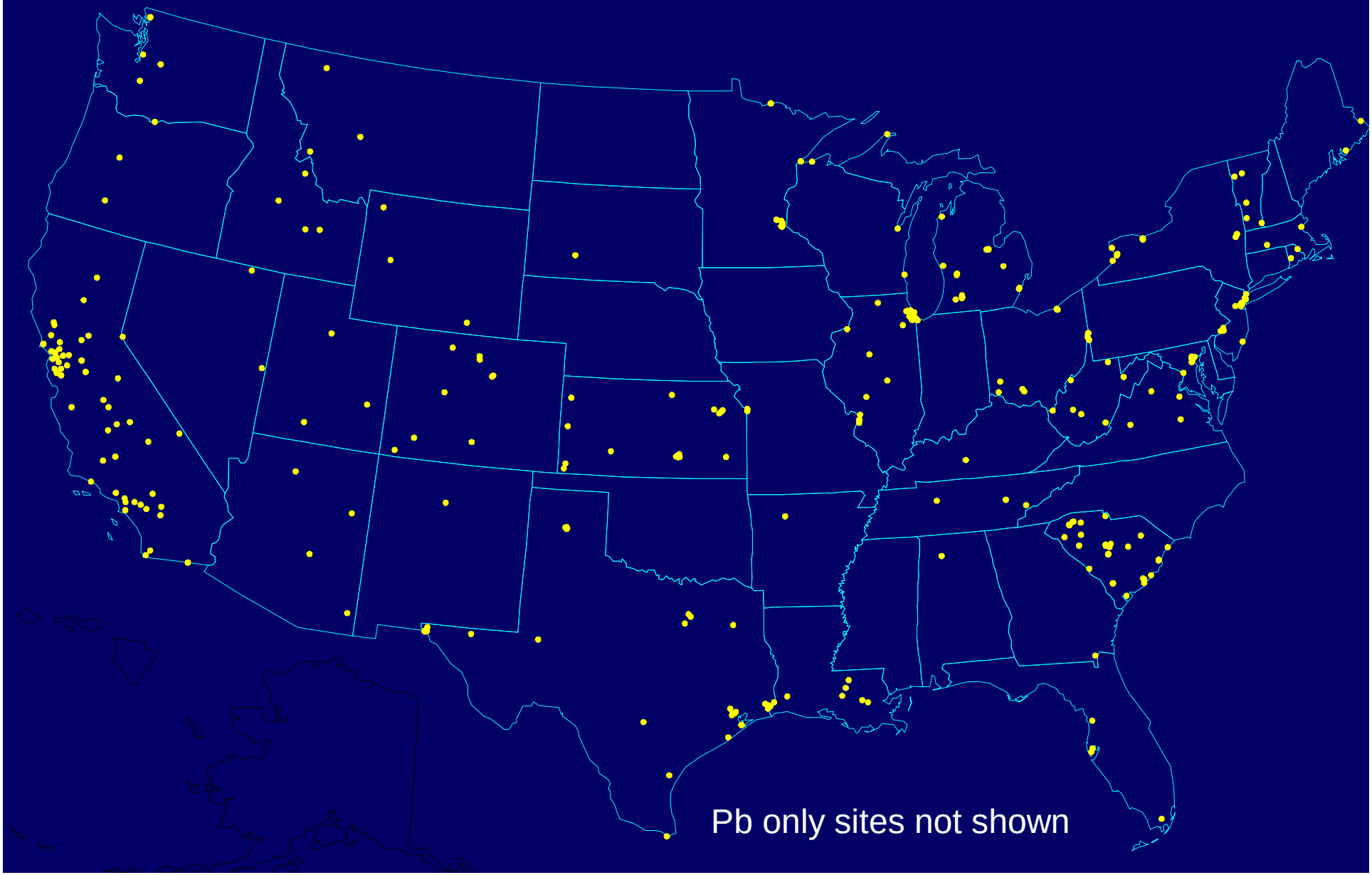
- Urban/local scale
  - Representative monitoring locations
    - Community-wide and/or hot spots
    - Higher number and density of sites
  - Duration: year-round or shorter-term
  - Sampling interval & frequency
    - Intermittent (24-hr)
    - Semi-continuous (<24-hr intervals)

Air Toxics Monitoring Sites, 1996 (any urban HAP)

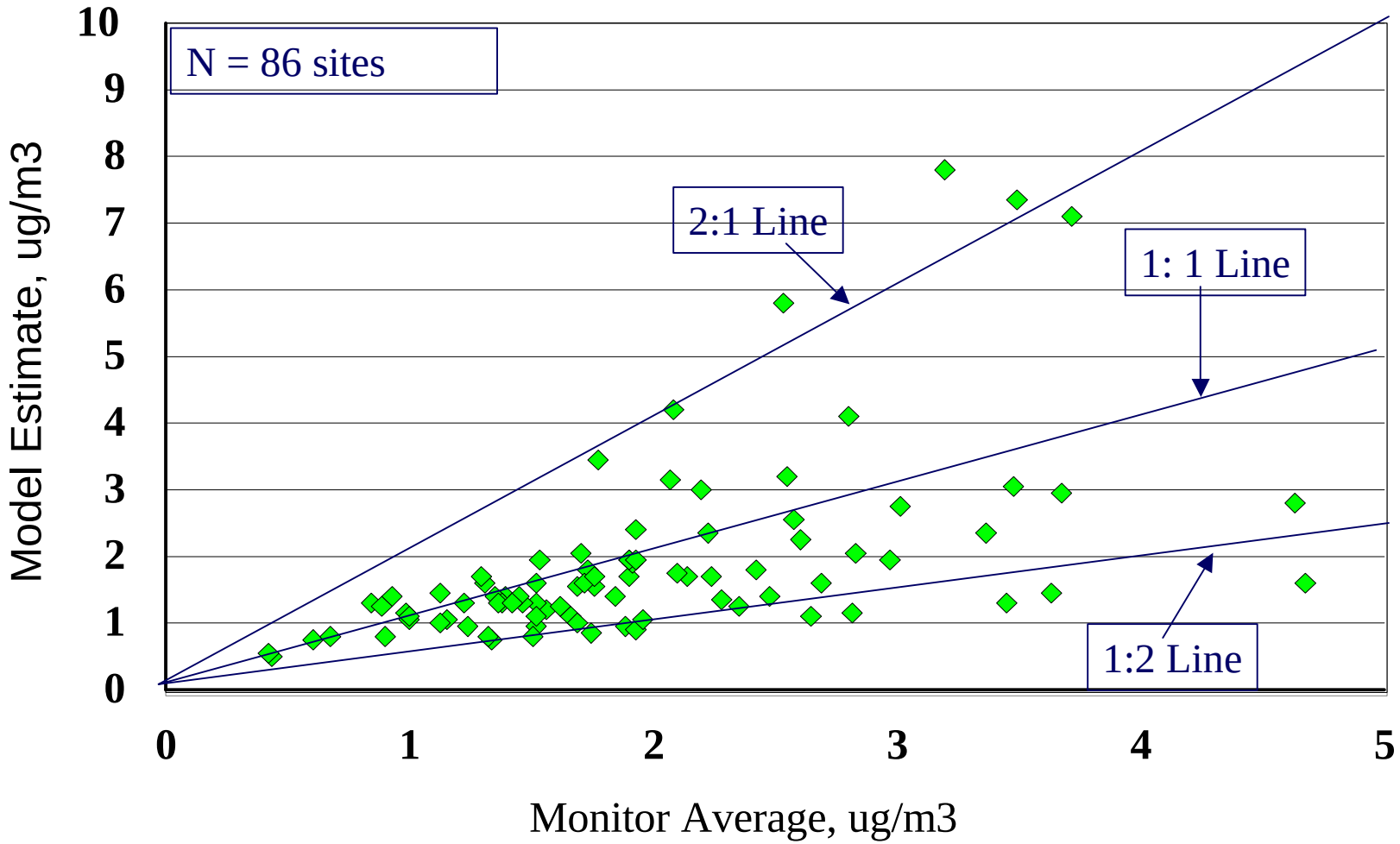


Air Toxics Monitoring Sites, 1996 (year round monitoring)

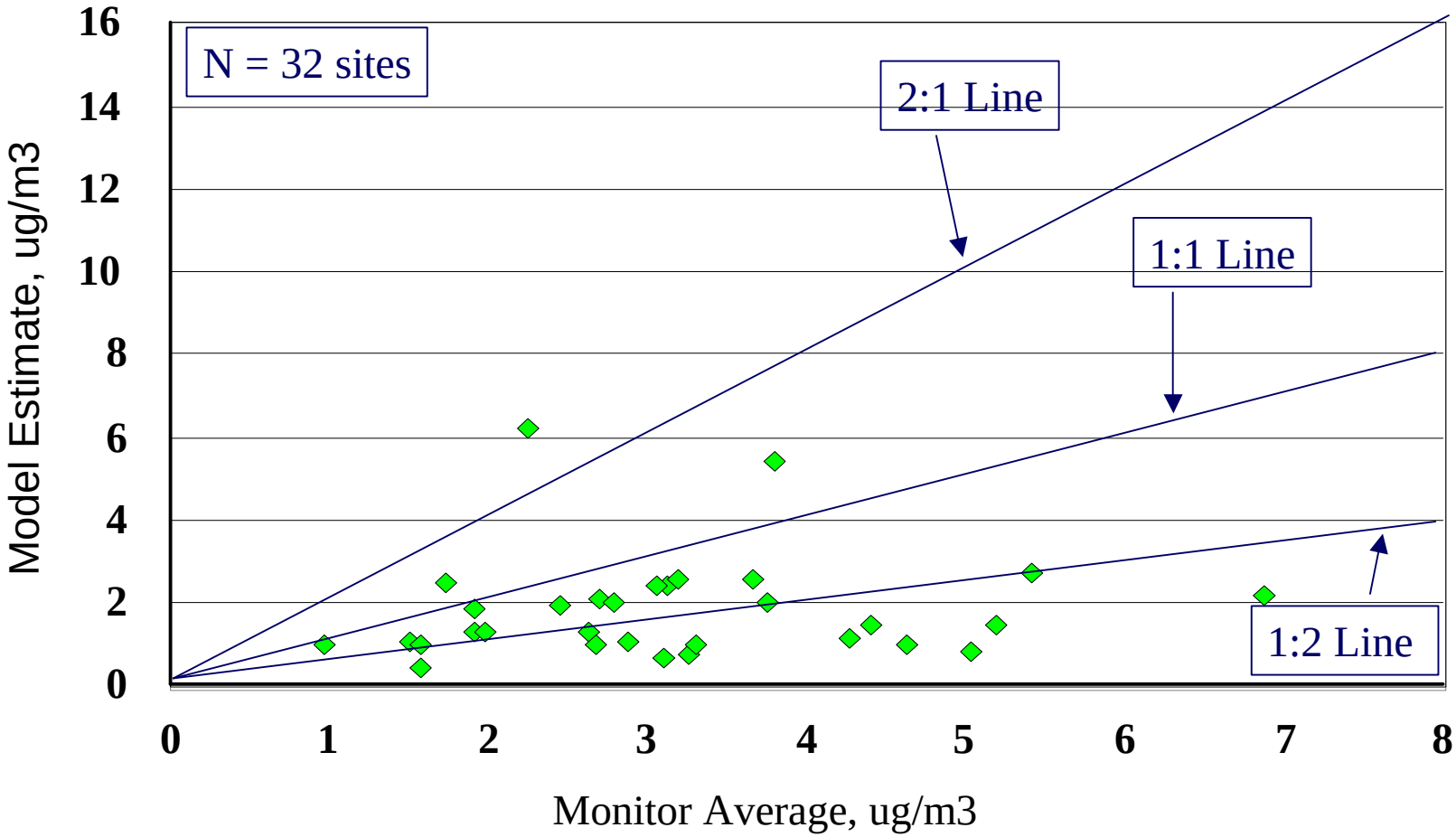
Fewer Sites provide annual average concentrations



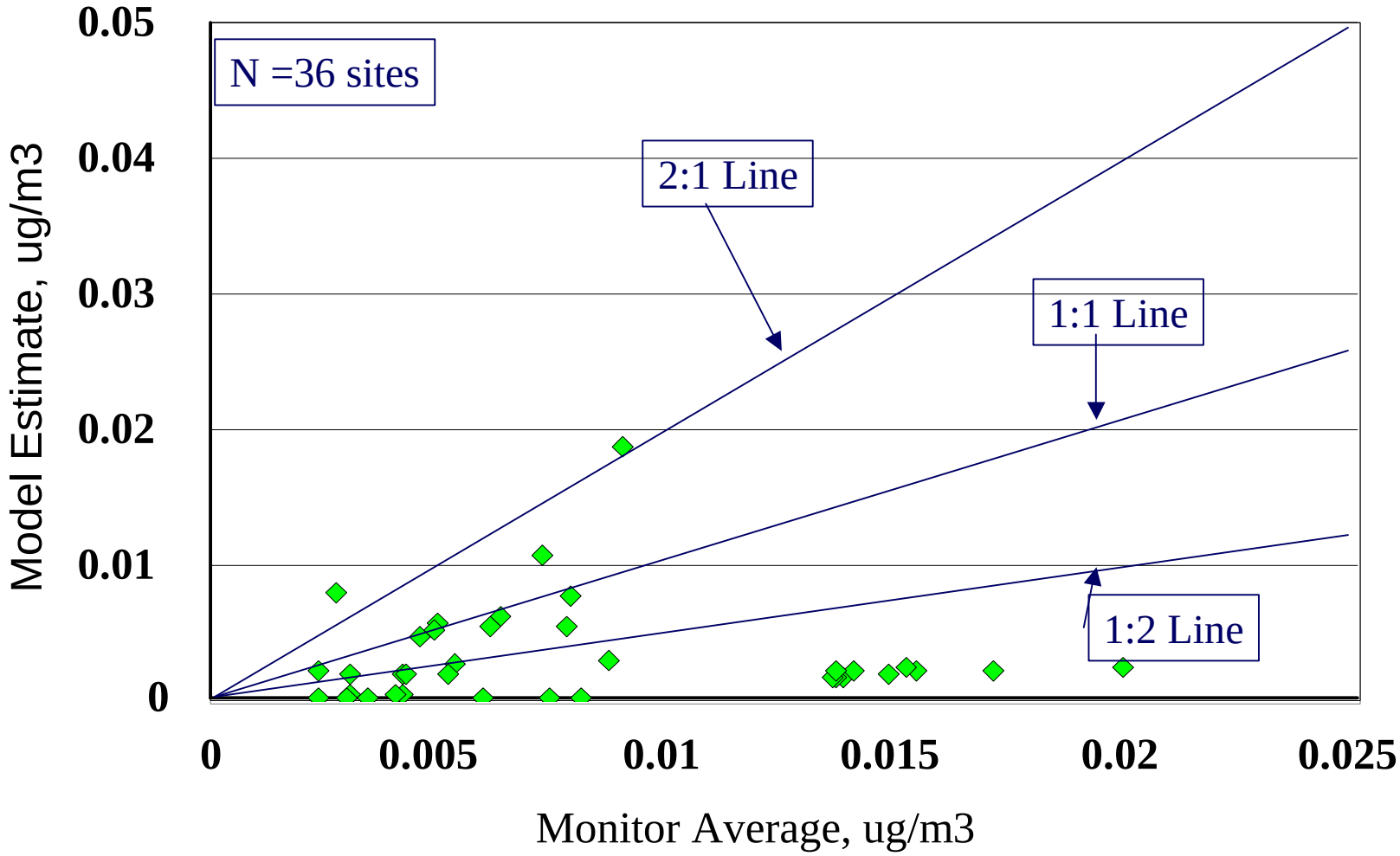
SCATTER PLOT FOR BENZENE



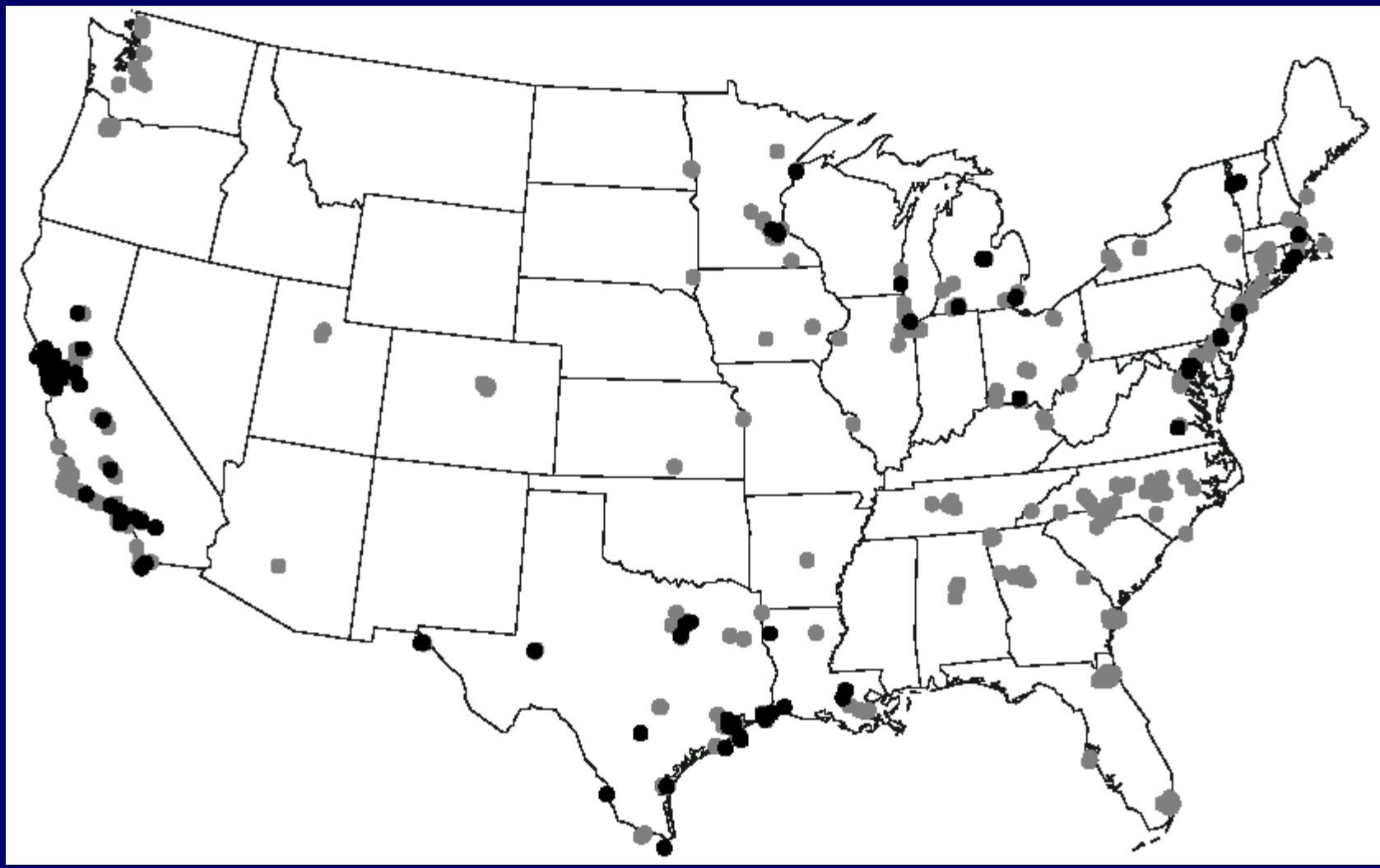
Scatter Plot for Formaldehyde



Scatter Plot for Chromium

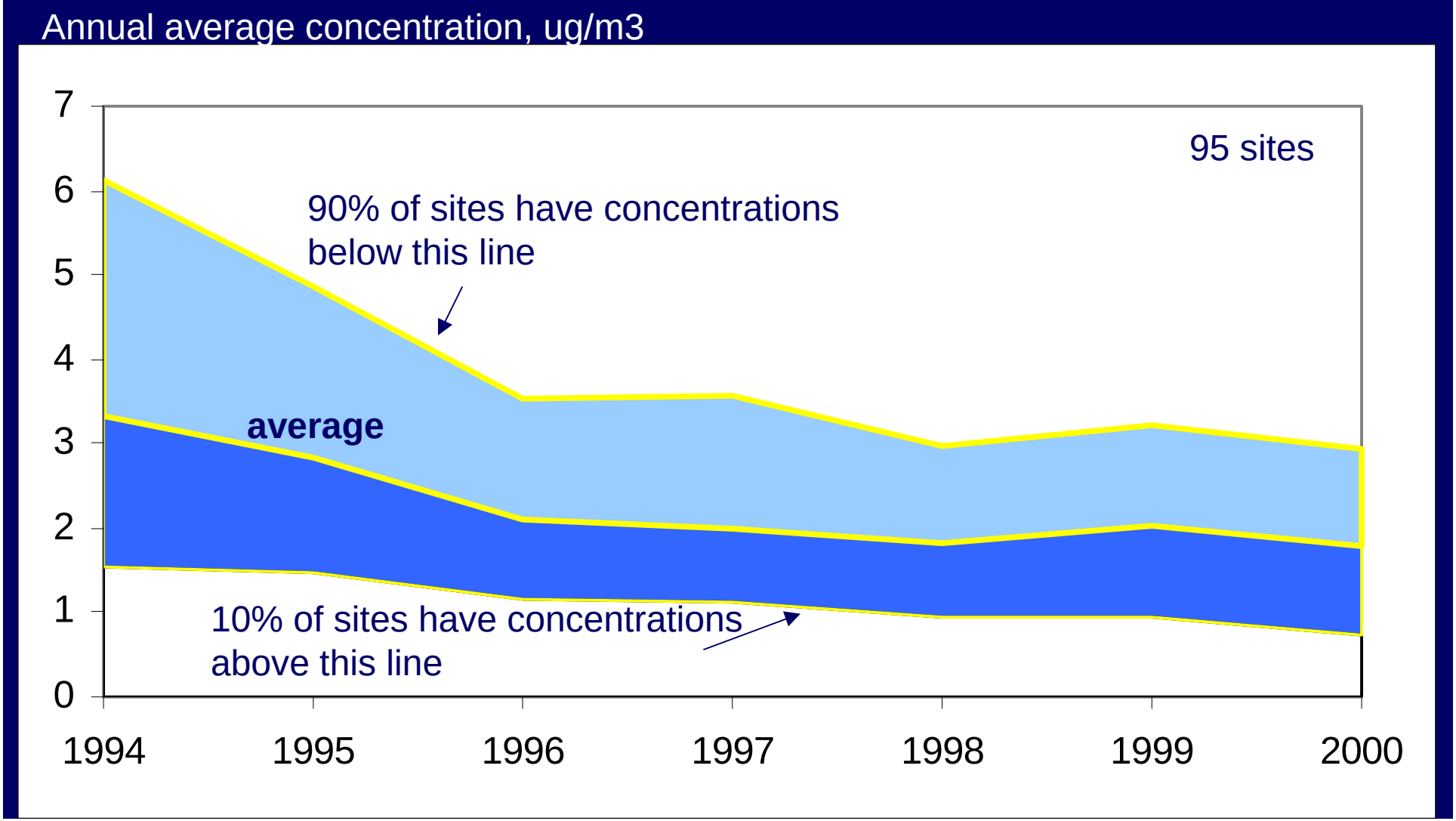


95 Benzene Sites with Sufficient Data for 1994-2000 Trends

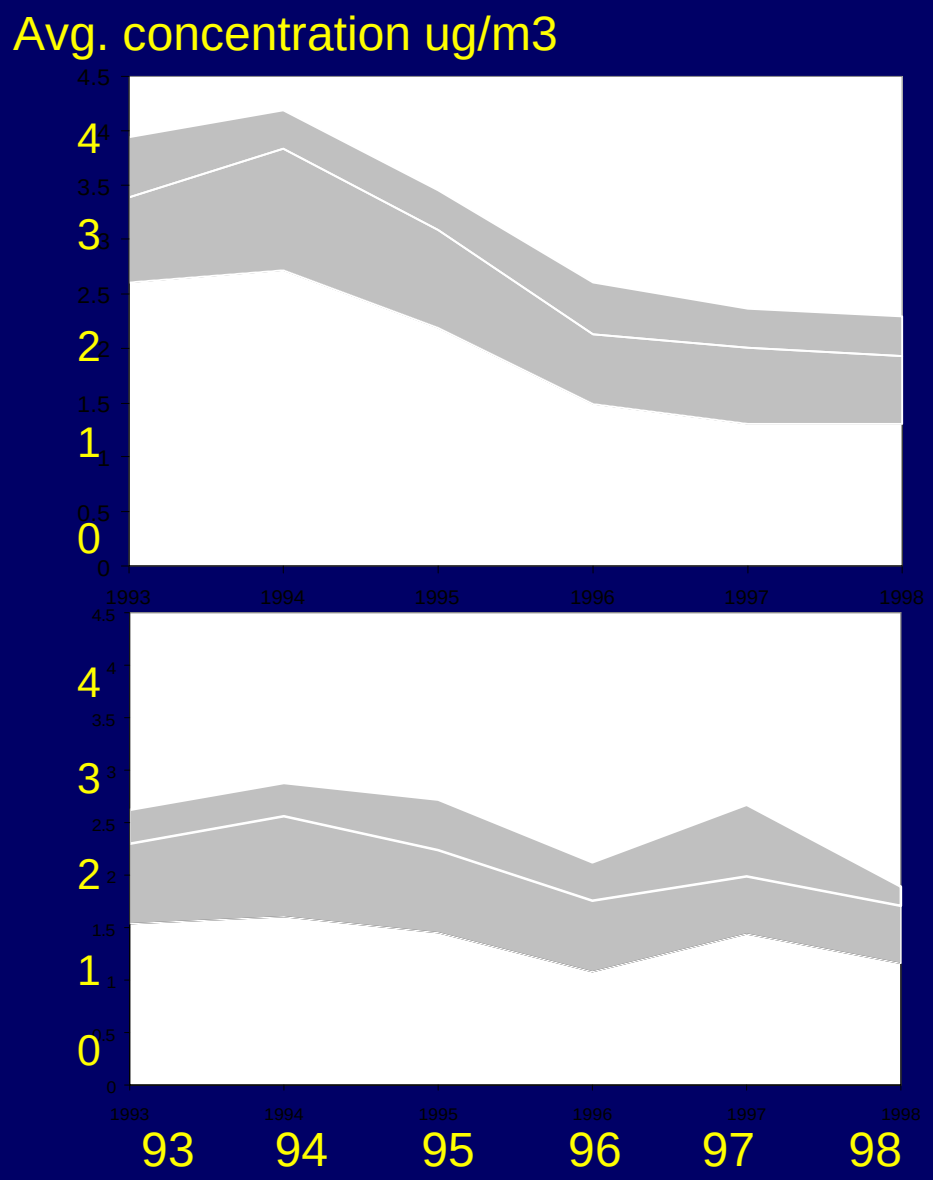


National Trend in Benzene Concentrations

surrogate for change in exposure



Monitoring Data Can Evaluate the Effects of Emission Changes



CA & RFG areas

--56 sites in 34 counties

-- 43% decrease

non-RFG areas

--28 sites in 13 counties

--26% decrease